OUTLINE FOR CORRECTIVE MEASURES STUDY (CMS) SCOPE-OF-WORK UNDER RCRA

1. Project Overview and Objectives

****
This section provides the Contractor with useful general information about the site. Refer to the RI/FS outline for more general information on the content of this section.
****

- 1.1 Site Description
  - 1.1.1 Location and Site Conditions
  - 1.1.2 Site Background
    - 1.1.2.1 Site Usage
    - 1.1.2.2 Disposal Practices
    - 1.1.2.3 Previous Studies and Results
    - 1.1.2.4 Regulatory Authorities

****
The project manager should state what RCRA authority this CMS is proceeding under. See "Regulatory Authority" section of the RFI.
****

- 1.2 Project Planning Overview and Corrective Measures Study Objectives

****
This section should describe for the Contractor the details of the USACE project planning process for the CMS. Refer to the RI/FS scope outline for additional information on these topics. In general, the basic purpose of a CMS is to develop and evaluate corrective action alternative(s) and to recommend the corrective measure(s) to be taken at the SWMU.

A CMS is very similar to a CERCLA FS but the actual requirements of the CMS are up to the RCRA regulators. The regulators may ask for more or less information than is provided herein. Thus, the project manager must discuss requirements of the CMS with the customer and the RCRA authorities prior to initiating a scope for the CMS.
****

1.2.1 Site Strategy
1.2.2 Project Objectives and Project Decision Statements
1.2.3 Preliminary Corrective Action Objectives

****
This section describes the general corrective action objectives based on team input and/or previous studies.
****

1.2.4 Data Quality Objectives
1.3 Summary of Required Tasks

****
This is only a superficial listing of tasks to be performed under this scope-of-work. No details are to be given here.
****

Task 1 CMS Workplan Preparation
Task 2 Community Relations
Task 3 Development of the Corrective Measure Alternatives
Task 4 Treatability Studies and Treatability Study Reports
Task 5 Justification and Recommendation of the Corrective Measure(s)
Task 6 Development of Media Clean Up Standards, Evaluation of Criteria for Further Action, and Recommendations
Task 7 CMS Report
Task 8 Post CMS Support

1.4 References

****
Include citations of previous reports, guidance documents, permits, RCRA documentation, enforcement orders/compliance agreements, site inspections, etc. List only those documents that the team possesses or can locate. Indicate which documents are being provided to the Contractor.
****

2. Project Requirements
2.1 Task 1 CMS Workplan Preparation

****
This section will require the preparation of a CMS workplan. Refer to the RI/FS outline for more information on the gen-

eral approach to project planning and contractor-prepared workplans.

2.1.1 Available Data Review
2.1.1.1 Review Previous Reports
2.1.1.2 Background Data Collection and Literature Searches
2.1.1.3 Site Boundaries Identification

****
This section would require the Contractor to identify the site boundaries if not previously established in the RFI.
****

2.1.2 Preliminary Site Visit
2.1.3 Refinement/Development of Data Quality Objectives
2.1.4 Treatability Study Sample Collection Design
2.1.5 Preparation of CMS Workplan
2.1.6 Preparation of Workplan Attachments

****
There may be necessary attachments to the CMS workplan. See technical requirements in Sections 4 and 5 for information on the Treatability Study Workplan Attachment (TSWP/CDAP), and SSHP. If no treatability study or field pilot test is necessary, but additional sampling is required to support the CMS, the preparation of other workplan attachments such as a Site Safety and Health Plan (SSHP), Monitoring Well Installation and Drilling Plan (MWIP) and a Chemical Data Acquisition Plan (CDAP) would be required. Refer to the RFI scope outline, Section 2.3.2, for scope format.
****

2.1.3.1 Treatability Study Workplan and Chemical Data Acquisition Plan (TSWP/CDAP) Attachment

****
Refer to Enclosure 12, Treatability Studies and the Chemistry Technical Requirements (Section 5.) of this scope-of-work for further requirements for this submittal. Also refer to Section 6. for requirements on drilling and well installation, if applicable.
****

2.1.3.2 Site Safety and Health Plan (SSHP) Attachment

****

Refer to Section 4 and Enclosure 8 for further requirements for this submittal.

****

2.1.3.3 Community Relation Plan (CRP)

****

Reference Task 2.

****

2.2 Task 2 Community Relations

****

Community Relation requirements are tied directly to the permitting process. The project manager should discuss with the customer and the RCRA regulators any requirements for community relations. The project manager can then put these requirements into the scope.

****

2.2.1 Preparation of Community Relations Support
2.2.2 Responsiveness Summary

****

One item that may be required of the Contractor after a public meeting on the proposed corrective measure(s) is a Responsiveness Summary. This should be coordinated with the user and RCRA regulators and identified in the scope. This document provides responses to each of the significant comments, criticisms, and any new data submitted on the proposed corrective measure(s). Refer also to the RI/FS SOW outline for general requirements/explanatory text related to these topics. Note that the RI/FS is prepared under CERCLA.

****

2.3 Task 3 Development of the Corrective Measure Alternatives

2.3.1 Development of Suitable Alternatives

****

See Enclosure 11, Alternative Development and Selection for additional information.

****

2.3.2 Cost Estimates

****
Unlike CERCLA, RCRA does not require alternatives to be screened on a cost effective basis. Cost information may be needed for programming purposes. Refer to the RI/FS outline for general information about this section.
****

2.3.2.1 Construction Costs
2.3.2.2 Other Project Markups

2.3.3 Plans/Schematics/CADD

****
See RI/FS outline for information on this topic.
****

2.3.4 NEPA Compliance Activities

****
See National Environmental Policy Act (NEPA) compliance discussion presented in the RFA and RFI scope outline. In addition, once a corrective action is selected, the programmatic NEPA documentation will have to be amended or NEPA documentation will have to be prepared for the selected corrective action. The project manager should discuss this matter with the NEPA experts and Office of Counsel in order to acquire scoping language and requirements.

Refer to the RI/FS scope outline for explanatory text on the NEPA compliance topics listed below.
****

2.3.4.1 Wetlands Determination
2.3.4.2 Flood Frequency/Flood Plain Analysis
2.3.4.3 Assessment of Cultural Resources

2.4 Task 4 Treatability Studies and Treatability Study Reports

****
See Enclosure 12, Treatability Studies and Treatability Study Reports for additional information. Omit if no treatability studies are performed. Treatability studies workplan development is covered in Section 2.1.3.1. Cross reference that section.

As an option, the Sample Collection Section and the Sample Analysis and Validation Section can be broken out as separate tasks. This may be appropriate if sampling is required for reasons other than treatability studies. Given the limited nature of the sampling in many studies and the important role of chemical analysis in many treatability studies, they are discussed under the treatability study task.
****

2.4.1 Treatability Studies
- 2.4.1.1 Screening Tests
- 2.4.1.2 Bench Scale Tests
- 2.4.1.3 Pilot Tests

2.4.2 Treatability Studies Sample Collection and Field Testing
- 2.4.2.1 Surface Soil Sampling
- 2.4.2.2 Surface Water/Lagoon Sampling
- 2.4.2.3 Leachate Sampling
- 2.4.2.4 Subsurface Soil Sampling
- 2.4.2.5 Water Level Measurement
- 2.4.2.6 Ground Water Sampling
- 2.4.2.7 Vadose Zone Permeability/Infiltration Testing
- 2.4.2.8 Aquifer Tests
- 2.4.2.9 Air Sampling

2.4.3 Treatability Sample Analyses, and Data Assessment

****
The following sections contain project specific information directing the Contractor as to analytical protocols for the treatability studies. General chemistry requirements are detailed in the Chemistry Technical Requirements Section (5.) to this SOW. That section provides specifications for the implementation of project activities related to chemistry. Work specified in this section of the SOW must be summarized by the Contractor in the treatability study workplan and the CDAP. The review of these submittals, assuring project goals are being met, is the duty of the USACE project team.
****

2.4.3.1 Data Review and Assessment

****
This section should specify functional guidelines for data assessment/validation procedures which the Contractor is responsible to perform. These specifications are divided into existing data and new data applications. The chemist, based

on project-specific needs, should define acceptable PARCC parameters (existing and newly acquired data) in tabular form. The chemist, industrial hygienist, and process engineer should contribute to specifications in these sections. DQOs and the goal of the CMS must be kept in mind when reviewing existing data and when specifying Contractor obligations to generate new data.
****

2.4.3.1.1 Existing Analytical Data

****
This section should include guidelines to the Contractor as to what constitutes acceptable analytical data. The chemist should define acceptable PARCC parameters for each treatability study and environmental assessment. Task the Contractor to submit a data review and assessment/validation plan for existing analytical data in the CDAP.

Information should be obtained from the RFI, EPA technical and enforcement files, state/local regulatory agency files, U.S. Geological Survey files, government installations, and other relevant sources in order to describe the current situation at the site(s). Quality of data should be analyzed to determine its usability.
****

2.4.3.1.2 New Data

****
This section should define guidelines for the appropriate analytical level to be used and corresponding PARCC parameters which will indicate acceptable data quality. A table should be prepared summarizing this information. The Contractor is tasked in this section to propose a data review and assessment/validation plan in the CDAP based on these guidelines. The chemist, process engineer, and industrial hygienist should develop this section of the SOW.

Chemical specific action levels should also be summarized to the extent possible. The Contractor will be responsible for reviewing and assessing the data resulting from the investigation.

Depending upon the project needs, external QA samples may be sent to a USACE QA laboratory. The chemist and process engineer should decide whether a USACE division QA laboratory needs to perform a review of the Contractor data in com-

parison with USACE QA samples. Reference the RI/FS SOW outline for explanatory text on the pre-draft data package which will be submitted to the division QA laboratory for review.

Refer to the RI/FS scope outline for explanatory text on the following sections.
****

2.4.3.2 Analytical Procedures
2.4.3.2.1 Water
2.4.3.2.1.1 Surface Water
2.4.3.2.1.2 Ground Water
2.4.3.2.2 Soils/Sediments/Sludges

****
The chemist, the process engineer and specific data end-users must consult to develop an appropriate analytical protocol based on treatability study needs.
****

2.4.3.2.3 Air Samples
2.4.3.3 Quality Assurance/Quality Control Samples
2.4.3.3.1 QA Laboratory
2.4.3.3.2 QC Samples
2.4.3.4 Laboratory Internal Quality Control
2.4.3.5 Method Detection Limits
2.4.3.6 Laboratory Turnaround Time
2.4.3.7 Sample Handling
2.4.3.8 Preservatives and Holding Times
2.4.3.9 Investigation-Derived Wastes
2.4.4 Data Evaluation

****
This section would require the Contractor to evaluate the results of the treatability studies in light of the objectives. This section would be developed with input from the process engineer, chemist, and other team members depending on the nature of the anticipated studies.
****

2.4.4.1 Comparison to Data Quality Objectives - Establish Data Usability

****
Refer to the corresponding section (2.5.1.1) of the RI/FS scope outline for explanatory text on this topic.
****

2.4.4.2 Refinement of Site Conceptual Model

****
Where applicable (depending on the amount of data generated which characterizes the site), the Contractor should be required to refine the site conceptual model. This effort would be documented in the Treatability Study Report or the CMS Report. Refer to the corresponding section (2.5.1.2) of the RI/FS scope outline for additional explanatory text on this topic.
****

2.4.5 Treatability Study Report

****
The draft treatability study report should be submitted prior to dismantling the study and prior to completion of the QA evaluation. The possibility of needing additional runs should always be anticipated. The final treatability study report should be presented as a part of the CMS Report. See Enclosure 12, Treatability Studies and Treatability Study Reports for more information.
****

2.4.5.1 Pre-Draft Data Package

****
This section would require the submittal of a pre-draft data package. Reference Section 2.4 of the RI/FS outline for the applicability of this report, and Section 2.7 of the RI/FS SOW outline for specifics on this submittal.
****

2.4.5.2 Draft Treatability Study Report

2.5 Task 5 Justification and Recommendation of the Corrective Measure(s)

****
Require the Contractor to recommend a corrective measure based on the analyses of alternatives per attachment K.

The recommendation should be justified on the factors listed below. This section would be developed by the technical manager or other team member with a familiarity with the EPA guidance for performing a CMS.
****

2.5.1 Justification Based on Technical Factors
2.5.1.1 Performance
2.5.1.2 Reliability
2.5.1.3 Implementability

****
Cost effectiveness may be a consideration in implementability.
****

2.5.1.4 Safety
2.5.2 Justification Based on Protection of Human Health
2.5.3 Justification Based on Protection of Environment

2.6 Task 6 Development of Media Clean Up Standards (MCS), Evaluation of Criteria for Further Action, and Recommendations.
2.6.1 Develop Media Cleanup Standards (MCSs)

****
Post review of the CMS final report by the regulating office, the EPA or state will set the Media Clean Up Standards (MCSs). Reference the 55 FR 30825 - 30834 for additional information. The Contractor should be tasked under this section to identify the action levels that may be appropriate for the site. Remember: You may have some influence over the MCSs set by the regulating agency depending on the health assessment conducted during the RFI. While these standards are the levels the site owner must achieve through the cleanup, demonstrating to the RCRA authorities through risk documentation that these levels are too stringent may impact the final MCSs set.
****

2.6.1.1 Soil
2.6.1.2 Ground Water
2.6.1.3 Surface Water
2.6.1.4 Air
2.6.2 Evaluation of Further Action and Recommendations

****
This section would require the Contractor to evaluate the site information developed to date against the action levels

(ALs) and MCSs in order to develop recommendations for further actions.
****

2.7 Task 7 CMS Report

****
Provide details on content and format of CMS Report here. Refer to EPA CMS guidance.
****

2.7.1 Draft CMS Report

****
The Treatability Study Report may be required as an appendix to the CMS Report.
****

2.7.2 Final CMS Report

2.8 Task 8 Post CMS Support

****
This could include many items, including support to the Corps and the customer in dealing with the regulators, or the development of the full cost estimate for the selected alternative.
****

3. Project Management

****
Refer to the explanatory text in the RI/FS scope outline for information regarding these topics.
****

3.1 Project Manager
3.2 Coordination with Other Entities
3.3 Conference Notes
3.4 Confirmation Notices
3.5 Government Support
3.5.1 Government Provided Data and Information
3.5.2 Existing Plans/Surveys/Air Photos
3.5.3 Utilities
3.5.4 Permits

****
The project manager should require through the scope that the Contractor submit a letter discussing all permits required to undertake the recommended corrective action.
****

3.5.5 Rights of Entry
3.5.6 Security
3.5.7 Equipment Storage/Staging Areas
3.5.8 Grading and Site Restoration
3.6 Travel and Meetings
3.6.1 Site Walkover
3.6.2 CMS Pre-Draft Report Review Meeting
3.6.3 CMS Draft Treatability Study Report Review Meeting
3.6.4 CMS Draft Report Meeting
3.6.5 CMS Final Report Review Meeting
3.6.6 Public Meetings

****
The project manager should contact the customer and RCRA authorities to determine if public meetings are required. Since the CMS is typically part of the permitting process, additional public meetings may not be required by the regulators.
****

3.6.7 Other Site Visits
3.6.8 Additional Trips
3.7 Schedules
3.8 Submittals

****
This section summarizes the submittals expected during the course of the project. No technical requirements are presented here. Number of copies required are specified here.
****

3.8.1 General Submittal Requirements
3.8.2 Document Submittal Register
3.8.3 CMS Workplans
3.8.3.1 Treatability Study Workplan and Chemical Data Acquisition Plan (TSWP/CDAP)
3.8.3.2 Site Safety and Health Plan (SSHP)
3.8.3.3 Community Relations Plan (CRP)
3.8.4 Progress Reports
3.8.4.1 Monthly Progress Reports

3.8.4.1 Daily Quality Control Reports
3.8.5 Survey Documents
3.8.6 Treatability Study Report
3.8.6.1 Pre-Draft Data Package
3.8.6.2 Draft Treatability Study Report
3.8.6.3 Final Treatability Study Report

****
This is optional. The final report can be presented as part of the CMS report.
****

3.8.7 CMS Report
3.8.7.1 Draft CMS Report
3.8.7.2 Final CMS Report
3.8.8 Cost Estimates
3.8.9 Quality Control Summary Report

4. Health and Safety Technical Requirements

****
This section presents the technical requirements for health and safety. Refer to Enclosure 8 to the ETL for the suggested language for this SOW section.
****

5. Chemistry Technical Requirements

****
This section presents the technical requirements for performance of sampling and analysis activities. Specific requirements are discussed under the individual topics. Additional guidance on the typical content of this section is provided as Enclosure 13 to the ETL, Chemistry Technical Requirements. An outline of the section is provided here.
****

5.1 Introduction
5.1.1 CDAP Format and Implementation Requirements
5.1.1.1 Section 1. Table of Contents
5.1.1.2 Section 2. Project Background Data
5.1.1.3 Section 3. Chemical Requirements to Support Project Data Quality Objectives (DQOs)
5.1.1.4 Section 4. Contractor Project Organization and Functional Areas of Chemistry Responsibilities
5.1.1.5 Section 5. Field Activities

****
Note that treatability studies require much greater sample volumes than ordinary investigations. Therefore, collaboration with the primary laboratory is required to define required volumes, and containment necessary.
****

5.1.1.5.1 Field Instrumentation and Equipment (Calibration and Maintenance)
5.1.1.5.2 Field Documentation
5.1.1.5.3 QC and QA Field Samples

****
The requirement for acquisition of field QA/QC samples may be applicable only at the beginning of the treatability study to ensure an accurate characterization of the wastestream.
****

5.1.1.5.4 Decontamination Procedures
5.1.1.5.5 Matrix: Groundwater Samples
- 5.1.1.5.5.1 Field Screening
- 5.1.1.5.5.2 Locations
- 5.1.1.5.5.3 Sampling Procedure
- 5.1.1.5.5.4 Analytical Procedure
- 5.1.1.5.5.5 Sample Containers, Preservations, Holding Times

5.1.1.5.6 Matrix: Surface Water Samples
- 5.1.1.5.6.1 Field Screening
- 5.1.1.5.6.2 Locations
- 5.1.1.5.6.3 Sampling Procedure
- 5.1.1.5.6.4 Analytical Procedure
- 5.1.1.5.6.5 Sample Containers, Preservations, Holding Times

5.1.1.5.7 Matrix: Leachate Samples
- 5.1.1.5.7.1 Field Screening
- 5.1.1.5.7.2 Locations
- 5.1.1.5.7.3 Sampling Procedure
- 5.1.1.5.7.4 Analytical Procedure
- 5.1.1.5.7.5 Sample Containers, Preservations, Holding Times

5.1.1.5.8 Matrix: Soil Samples
- 5.1.1.5.8.1 Field Screening
- 5.1.1.5.8.2 Locations

5.1.1.5.8.3 Sampling Procedure
5.1.1.5.8.4 Analytical Procedure
5.1.1.5.8.5 Sample Containers, Preservations, Holding Times
5.1.1.5.9 Matrix: Sludge / Sediment Samples
5.1.1.5.9.1 Field Screening
5.1.1.5.9.2 Locations
5.1.1.5.9.3 sampling Procedure
5.1.1.5.9.4 Analytical Procedure
5.1.1.5.9.5 Sample Containers, Preservations, Holding Times
5.1.1.6 Section 6. Sample Chain of Custody, Packing and Shipping

****
It is important to collaborate with the project regulatory specialist on correct manifesting and shipping requirements.
****

5.1.1.7 Section 7. Laboratory Activities
5.1.1.7.1 Cooler Receipt Form
5.1.1.7.2 Instrument Calibration and Frequency
5.1.1.7.3 Quality Control Procedures
5.1.1.7.4 Preventive Maintenance
5.1.1.7.5 Corrective Action
5.1.1.7.6 Data Reduction, Assessment / Validation, and Documentation
5.1.1.8 Section 8. Chemical Data Quality Management Deliverables
5.1.1.8.1 Laboratory Daily Quality Control Reports
5.1.1.8.2 Quality Control Summary Report
5.1.2 Contractor Laboratory Approval
5.1.2.1 Commercial Laboratory Evaluation
5.1.2.2 Laboratory Quality Management Manual
5.1.2.3 Preliminary Questionnaire
5.1.2.4 Performance Evaluation Samples
5.1.2.5 Lab Inspection
5.1.2.6 Approval
5.1.2.7 Expiration of Validation
5.2 Miscellaneous Requirements
5.2.1 Investigation Derived Wastes

****
Treatability studies require much greater volumes than ordinary investigations. Therefore, the remaining laboratory sample may be substantial and require additional cost for disposal by the laboratory, or returning to the site for disposal via the chosen remedial alternative. It is important to collaborate with the project regulatory specialist on correct manifesting and shipping requirements.
****

6. Geotechnical Requirements

****
It is anticipated that only limited field sampling or testing will be necessary to support the CMS. Those activities which may commonly be required are listed below. The variety of potentially required field investigations for treatability studies or modeling efforts under a CMS are a subset of those that may be required under a RI or RFI; therefore, refer to text in the Geotechnical Requirements Section (6.) of the RI/FS scope-of-work outline for general and typical requirements and other information on these topics.
****

- 6.1 General Specifications
  - 6.1.1 Qualified Geologist/Geotechnical Engineer
  - 6.1.2 Applicable Driller Permits and Licenses
  - 6.1.3 Compliance with State Requirements
  - 6.1.4 Utility Clearances
  - 6.1.5 Disposal of Investigation Derived Waste (IDW)
  - 6.1.6 Explosive Ordnance Disposal
  - 6.1.7 Decontamination of Equipment/Tools
  - 6.1.8 Water Source and Testing
  - 6.1.9 Site Restoration and Protection
  - 6.1.10 Contractor Responsibility for Wells
  - 6.1.11 Site Surveying
- 6.2 Monitoring Well Installation and Drilling Plan (MWIP) Attachment

****
This would be required if drilling was associated with obtaining treatability study samples or performing pilot tests of ground water or soil vapor extraction.
****

6.3 Subsurface Soil/Rock Sampling
- 6.3.1 Drilling Method
- 6.3.2 Test Pit Excavation
- 6.3.3 Logging Requirements
- 6.3.4 Geotechnical Sampling and Analyses
- 6.3.5 Coring/Core Handling
- 6.3.6 Backfilling
- 6.3.7 Sampling Techniques
- 6.3.8 Field Screening
- 6.3.9 Location/Elevation Survey of Boreholes/Test Pits

6.4 Monitoring Well Installation
- 6.4.1 Drilling Method
- 6.4.2 Soil/Rock Sampling While Drilling
- 6.4.3 Field Screening
- 6.4.4 Casing and Screen
- 6.4.5 Gravel/Sand Pack
- 6.4.6 Grouting
- 6.4.7 Surface Completion
- 6.4.8 Well Development
- 6.4.9 Monitoring Well Construction Diagrams
- 6.4.10 Survey
- 6.4.11 In-Situ Permeability (Single Well) Testing
- 6.4.12 Water Level Measurements
- 6.4.13 Dedicated Pumps and/or Bailers
- 6.4.14 Well Sampling

6.5 Aquifer Tests
- 6.5.1 Pump Test Plan
- 6.5.2 Pumping Well Installation
  - 6.5.2.1 Drilling Method
  - 6.5.2.2 Soil Sampling While Drilling
  - 6.5.2.3 Field Screening
  - 6.5.2.4 Casing and Screen
  - 6.5.2.5 Gravel/Sand Pack
  - 6.5.2.6 Grouting
  - 6.5.2.7 Surface Completion
  - 6.5.2.8 Well Development
  - 6.5.2.9 Well Construction Diagram
  - 6.5.2.10 Well Survey
  - 6.5.2.11 Initial Water Level Measurements
  - 6.5.2.12 Pump
  - 6.5.2.13 Initial Well Sampling
- 6.5.3 Observation Well Construction
  - 6.5.3.1 Location(s) and Depth(s)
  - 6.5.3.2 Drilling Method
  - 6.5.3.3 Soil Sampling While Drilling
  - 6.5.3.4 Field Screening

****
This section presents the technical requirements for performance of activities associated with air impact assessments. Enclosure 16 presents a general description of air impact assessments for those not familiar with the process.

Explanatory text is included in the RI/FS outline. The scope of activities performed in the CMS is comparable to the FS. The level of detail to be included in the scope depends on the project and the Contractor's experience in performing air monitoring and modeling as well as the Contractor's experience in working with the Corps.
****